

CLAIMS

1-27. (Canceled)

28. (Currently Amended) A method in a computer system for generating a new representation of a document, the document having a current representation that is based on a hierarchical model in which hierarchical relationships between elements are defined by the model and non-hierarchical relationships between elements and content of elements are not defined by the model, the method comprising:

identifying entities referenced by elements of the current representation that are to be items in the new representation, wherein the current representation represents some relationships between entities hierarchically by nesting elements and other relationships non-hierarchically by referring to another element of the hierarchical model, such that the current representation contains multiple references to at least one entity, wherein identifying entities comprises parsing expressions of the elements of the current representation using parsing rules;

for each identified entity, creating for the new representation an item corresponding to the identified entity, wherein only one item is created in the new representation for the at least one entity having multiple references in the current representation, wherein creating the item comprises generating the new representation using generation rules that specify patterns for creating items of the new representation;

for each created item, adding to the item that is a subject of a hierarchical relationship as indicated by the current representation a relation to each item corresponding to an identified element that is an object of the hierarchical relationship as indicated by the current representation; and

for non-hierarchical relationships between elements and content of elements as indicated by the current representation, adding to an item corresponding to

the element that is the subject of the non-hierarchical relationship a relation to the item corresponding to the content of the element that is the object of the non-hierarchical relationship,

wherein the created items and the added relations form the new representation of the document, such that when an entity is the subject of both a hierarchical and nonhierarchical relationship in the current representation, the new representation contains a single instance of the entity and wherein the new representation forms a data structure that can be traversed by relationships between entities such that a program can use the new representation to interpret hierarchical and nonhierarchical relationships in the same way.

29. (Previously Presented) The method of claim 28 wherein in the current representation the hierarchical relationships are explicit and the non-hierarchical relationships are implicit.

30. (Previously Presented) The method of claim 28 wherein the hierarchical model is XML based.

31. (Previously Presented) The method of claim 30 wherein the hierarchical relationships are indicated by parent and child relationships of XML elements.

32. (Previously Presented) The method of claim 30 wherein a non-hierarchical relationship is an attribute of an XML element that refers to another XML element.

33. (Previously Presented) The method of claim 30 wherein a non-hierarchical relationship is a property of an XML element that refers to another XML element.

34. (Previously Presented) The method of claim 30 wherein a non-hierarchical relationship is content of an XML element that refers to another XML element.

35. (Previously Presented) The method of claim 28 wherein the new representation is based on an item, relationship, and attribute model.

36. (Previously Presented) A method in a computer system for generating a new representation of a document, the document having a current representation that is based on a hierarchical model in which hierarchical relationships between elements are defined by the model and non-hierarchical relationships between elements and content of elements are not defined by the model, the method comprising:

- identifying elements of the current representation that are to be items in the new representation, wherein the current representation represents some relationships between entities hierarchically by nesting elements and other relationships non-hierarchically by referring to another element of the hierarchical model, such that the current representation contains multiple references to at least one entity;

- for hierarchical relationships between elements of the current representation, adding to an item corresponding to the element that is a subject of the hierarchical relationship a relation to the item corresponding to the element that is an object of the hierarchical relationship;

- for non-hierarchical relationships between elements and content of elements of the as indicated by the current representation, adding to an item corresponding to the element that is the subject of the non-hierarchical relationship a relation to an item corresponding to the content of the element that is the object of the non-hierarchical relationship; and

- adding to items attributes of corresponding elements of the current representation that do not indicate a relationship between elements,

- wherein only one item is created in the new representation for the at least one entity having multiple references in the current representation.

37. (Previously Presented) The method of claim 36 wherein the hierarchical relationships are explicit and the non-hierarchical relationships are implicit in the document and wherein the non-hierarchical relationships are explicit in the new representation of the document.

38. (Previously Presented) The method of claim 36 wherein the hierarchical model is XML based.

39. (Previously Presented) The method of claim 38 wherein the hierarchical relationships are indicated by parent and child relationships of XML elements.

40. (Previously Presented) The method of claim 38 wherein a non-hierarchical relationship is an attribute of an XML element that refers to another XML element.

41. (Previously Presented) The method of claim 38 wherein a non-hierarchical relationship is a property of an XML element that refers to another XML element.

42. (Previously Presented) The method of claim 38 wherein a non-hierarchical relationship is content of an XML element that refers to another XML element.

43. (Previously Presented) The method of claim 36 wherein the new representation of the document is based on an item, relationship, and attribute model.

44. (Previously Presented) A computer-readable medium containing instructions for controlling a computer system to generate a new representation of a document, the document having a current representation based on an XML model in which hierarchical relationships between elements are defined by the XML model and non-hierarchical relationships between elements and contents of elements are not defined by the model, by a method comprising:

- identifying elements of the current representation that are to be items of the new representation, wherein the current representation represents some relationships between entities hierarchically by nesting elements and other relationships non-hierarchically by referring to another element of the hierarchical model, such that the current representation contains multiple references to at least one entity;

- for hierarchical relationships between elements of the current representation, adding to an item corresponding to the element that is a subject of the hierarchical relationship a relation to the item corresponding to the element that is an object of the hierarchical relationship; and

- for non-hierarchical relationships between elements and content of elements of the current representation, adding to an item corresponding to the element that is the subject of the non-hierarchical relationship a relation to the item corresponding to the content of the element that is the object of the non-hierarchical relationship,

- wherein only one item is created in the new representation for the at least one entity having multiple references in the current representation.

45. (Previously Presented) The computer-readable medium of claim 44 wherein the hierarchical relationships are explicit and the non-hierarchical relationships are implicit.

46. (Previously Presented) The computer-readable medium of claim 44 wherein the hierarchical relationships are indicated by parent and child relationships of XML elements.

47. (Previously Presented) The computer-readable medium of claim 44 wherein a non-hierarchical relationship is an attribute of an XML element that refers to another XML element.

48. (Previously Presented) The computer-readable medium of claim 44 wherein a non-hierarchical relationship is a property of an XML element that refers to another XML element.

49. (Previously Presented) The computer-readable medium of claim 44 wherein a non-hierarchical relationship is content of an XML element that refers to another XML element.

50. (Previously Presented) The computer-readable medium of claim 44 wherein the new representation of the document is based on an item, relationship, and attribute model.